REMARKS

Claims 4-14 are currently pending in this application.

Claim Rejections - 35 U.S.C. §112

Claim 13 stands rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Applicants respectfully traverse this rejection.

The present application teaches using gyroscopic actuators to supply the torque necessary for maintaining the attitude of a satellite when subjected to disturbing forces or torques (*see* page 4, lines 2-6 and page 5, lines 22-31). Gyroscopic actuators are known to change the attitude of a satellite through precession. Because gyroscopes are known to use precession, the present application supports claim 13, which recites that the necessary torque for maintaining the predetermined set attitude is based on the precession tendency of one or more of the gyroscopes. Accordingly, it is clear from the originally filed application that Applicants possessed the invention of claim 13 and that claim 13 is supported by the originally filed application. The Examiner asserts that there is no disclosure that the invention knows the precession tendency of the gyroscope beforehand or simply uses feedback to account for the precession tendency (*see* item 2 on page 2 of the Office Action). Claim 1 does not require the specific methods noted by the Examiner. Furthermore, it is within the knowledge of one of ordinary skill in the art to maintain the predetermined set attitude based on the precesseion tendency of the gyroscopes as set forth in claim 1, including the methods suggested by the Examiner. In view of the above,

Applicants respectfully request that the Examiner withdraw the rejection of claim 13 as failing to comply with the written description requirement.

Claim Rejections - 35 U.S.C. §103

A) Claims 4-10 and 12-14

Claims 4-10 and 12-14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Collyer (U.S. Patent No. 5,931,419) in view of Markley et al. ("Attitude Control System Conceptual Design for Geostationary Operational Environmental Satellite Spacecraft Series"). Applicants respectfully traverse this rejection.

Claims 4 and 8 are independent claims and the remaining claims depend from one of claims 4 and 8. The Examiner asserts that Collyer discloses several features of the claimed attitude control system, but acknowledges that Collyer does not disclose, among other things, an attitude regulation loop including a corrector such that the bandwidth of the loop contains the lowest and most energetic frequencies of the flexible modes of the elongate members. The Examiner asserts that this deficiency of Collyer is corrected by Markley. However, Markley is also deficient with regard to the claimed attitude regulation loop and therefore, cannot correct the deficiency of Collyer.

Markley teaches two levels of control. The first level of control is referred to as a spacecraft controller or a baseline controller (*see* Fig 3; and page 249, second column to page 250, second column). The spacecraft controller controls reaction wheel torques. Also, the spacecraft

controller has a bandwidth of 0.1 Hz and does not excite the first significant flexible mode of the solar array.

In addition to the spacecraft controller, Markley teaches a second level of control, specifically, spacecraft motion compensation (*see* Fig. 6; and page 250, second column to page 251, second column). This spacecraft motion compensation attenuates disturbances of frequencies from the controller bandwidth to 5 Hz. The spacecraft motion compensation involves repointing the instrument mirrors to compensate for attitude errors (*see* page 247, first column).

Claims 4 and 8 recite that the attitude regulation loop, which contains the lowest and most energetic frequencies of the flexible modes of the elongate members, provides a control signal to the gyroscopic actuators. Neither of the Markley controls (the spacecraft control and the spacecraft motion compensation) teaches or suggests this feature of the claimed invention. The Markley spacecraft controller does not teach or suggest such a feature at least because it specifically teaches that the lowest and most energetic frequencies are avoided. Furthermore, the Markley spacecraft motion compensation does not teach or suggest such a feature at least because the spacecraft motion compensation merely involves repointing instrument mirrors, and does not provide a control signal to the Markley reaction wheels. Accordingly, neither control of Markley teaches an attitude regulation loop which contains the lowest and most energetic frequencies of the flexible modes of the elongate members and provides a control signal to gyroscopic actuators. Therefore, Markley cannot correct this deficiency of Collyer, and claims 4 and 8 are allowable over the combined teachings and suggestions of Collyer and Markley.

Claims 5-7 depend from claim 4, and claims 9, 10 and 12-14 depend from claim 8. Therefore, claims 5-7, 9, 10 and 12-14 are allowable at least because of their respective dependencies.

B) Claim 11

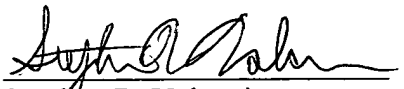
Claim 11 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Collyer in view of Markley and further in view of Parvez et al. (U.S. Patent No. 6,089,507). Claim 11 depends from claim 8 and is, therefore, allowable at least because of its dependency.

Conclusion

In view of the preceding amendments and remarks, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby earnestly solicited. If there are any points remaining in issue that the Examiner feels may be best resolved through a personal or telephonic interview, he is kindly requested to contact the undersigned at the local telephone number listed below.

The USPTO is directed and authorized to charge all required fees (except the Issue/Publication Fees) to our Deposit Account No. 19-4880. Please also credit any over-payments to said Deposit Account.

Respectfully submitted,



Stephen R. Valancius
Registration No. 57,574

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

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23373
CUSTOMER NUMBER

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